

Appl. No. 10/604,703
Response dated Jan. 27, 2006
Reply to Not. of Non-Compliant Amend. of Jan. 25, 2006

Amendments to the Claims:

The following listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1-87 (cancelled)

Claim 88 (new): An apparatus for reliably supplying electrical energy to an electrical system connected between a system positive terminal and a system negative terminal, the apparatus comprising:

a main battery having a main positive output and a main negative output, the main negative output being electrically connected to the system negative terminal;

at least one standby battery having at least one standby positive output and at least one standby negative output, the at least one standby negative output being electrically connected to the system negative terminal;

a one-way charging circuit electrically connected between the main positive output and the at least one standby positive output, the one-way charging circuit configured to facilitate charging of and prevent current flow from the at least one standby battery at all times during which the main battery is supplying electrical energy to the electrical system; and

a switching device operable in a plurality of independent operating positions to at least selectively electrically connect the system positive terminal to one of the main positive output and the at least one standby positive output, the switching device being operable in a first operating position to electrically connect the main positive output to the system positive terminal and electrically disconnect the system positive terminal from the at least one standby positive output, the switching device being further operable in a second operating position independent of the first operating position to electrically connect the at least one standby positive output to the system positive terminal and electrically disconnect the system positive terminal from the main positive output,

Appl. No. 10/604,703
Response dated Jan. 27, 2006
Reply to Not. of Non-Compliant Amend. of Jan. 25, 2006

wherein, when the switching device is in the first operating position, the main battery is the sole source of electrical energy to the electrical system and wherein, when the switching device is in the second operating position, the at least one standby battery is the sole source of electrical energy to the electrical system, such that the main battery and the at least one standby battery never supply electrical energy to the electrical system simultaneously.

Claim 89 (new): The apparatus of claim 88, wherein the main battery is a six-volt, twelve-volt, or twenty-four volt battery.

Claim 90 (new): The apparatus of claim 88, wherein the at least one standby battery is a six-volt, twelve-volt, or twenty-four volt battery.

Claim 91 (new): The apparatus of claim 88, further comprising:

a battery housing that includes a main battery compartment and at least one standby battery compartment, the main battery compartment containing the main battery and the at least one standby battery compartment containing the at least one standby battery.

Claim 92 (new): The apparatus of claim 91, wherein the main battery compartment is located atop the at least one standby battery compartment.

Claim 93 (new): The apparatus of claim 91, wherein the battery housing comprises at least one fill tube.

Claim 94 (new): The apparatus of claim 91, wherein the battery housing has external dimensions characteristic of a conventional vehicle battery housing.

Claim 95 (new): The apparatus of claim 88, wherein the one-way charging circuit comprises a diode.

Appl. No. 10/604,703
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Claim 96 (new): The apparatus of claim 88, wherein the one-way charging circuit has an amperage rating between about 25 and 95 amps.

Claim 97 (new): The apparatus of claim 88, wherein the main battery is a 12-volt automobile battery and the one-way charging circuit has an amperage rating of 45 amps.

Claim 98 (new): The apparatus of claim 88, wherein the switching device is operable in a third operating position independent of the first operating position and the second operating position to electrically disconnect the system positive terminal from both the main positive output and the at least one standby positive output, thereby preventing electrical energy from flowing out of either the at least one standby battery or the main battery to the electrical system.

Claim 99 (new): The apparatus of claim 88, further comprising:

a controller coupled to the main battery, the at least one standby battery, and the switching device, the controller operable to control operation of the switching device based on one or more operating parameters of the main battery and the at least one standby battery.

Claim 100 (new): The apparatus of claim 99, wherein the one or more operating parameters of the main battery and the at least one standby battery include a voltage of the main battery, a voltage of the at least one standby battery, temperature, vibration, current flow from the main battery and current flow from the at least one standby battery.

Claim 101 (new): The apparatus of claim 88, further comprising:

a discharge cycling system coupled to the switching device and operable to periodically discharge the at least one standby battery.

Claim 102 (new): The apparatus of claim 101, wherein the discharge cycling system comprises a timer operable to periodically cause the switching device to switch from the first operating position to the second operating position, remain in the second operating position for a period of time, and switch back to the first operating position after the period of time.

Appl. No. 10/604,703
Response dated Jan. 27, 2006
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Claim 103 (new): The apparatus of claim 88, wherein the switching device is a three position switching device.

Claim 104 (new): An apparatus for reliably supplying electrical energy to an electrical system, the apparatus comprising:

a main battery;

at least one standby battery;

a one-way charging circuit coupled between the main battery and the at least one standby battery, the one-way charging circuit being configured to facilitate charging of and prevent current flow from the at least one standby battery at all times during which the main battery is supplying electrical energy to the electrical system; and

a switching device coupled to the main battery, the at least one standby battery and the electrical system, the switching device being operable in a first operating position to permit electrical energy to flow out of the main battery to the electrical system and prevent electrical energy from flowing out of the at least one standby battery to the electrical system, the switching device being further operable in a second operating position independent of the first operating position to permit electrical energy to flow out of the at least one standby battery to the electrical system and prevent electrical energy from flowing out of the main battery to the electrical system,

wherein, when the switching device is in the first operating position, the main battery is the sole source of electrical energy to the electrical system and wherein, when the switching device is in the second operating position, the at least one standby battery is the sole source of electrical energy to the electrical system, such that the main battery and the at least one standby battery never supply electrical energy to the electrical system simultaneously.

Appl. No. 10/604,703
Response dated Jan. 27, 2006
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Claim 105 (new): A method for reliably providing electrical energy from a main battery or at least one standby battery to an electrical system that includes battery charging functionality, the method comprising:

initially providing electrical energy to the electrical system solely from the main battery while preventing electrical energy from flowing out of the at least one standby battery to the electrical system;

using the electrical system to automatically charge the at least one standby battery during operation of the main battery; and

subsequently providing electrical energy to the electrical system solely from the at least one standby battery while preventing electrical energy from flowing out of the main battery to the electrical system, such that the main battery and the at least one standby battery never supply electrical energy to the electrical system simultaneously.